

What is claimed is:

1. A lens barrel comprising:

a guide barrel, an outer ring, an inner ring, a cam ring and a movable lens frame, arranged in that order from a radially  
5 outermost side, wherein the axes thereof are coincident with a common optical axis; said outer ring being linearly guidable in the common optical axis direction by said guide barrel, said inner ring being linearly guidable in the common optical axis direction by said outer ring via a linear guide key and a linear  
10 guide groove provided on one and the other of said inner ring and said outer ring, respectively, and said cam ring being rotatable to move said movable lens frame in the common optical axis direction; and

a lens barrier mechanism having an aperture positioned in  
15 front of said movable lens frame, said lens barrier mechanism provided on a front opening of said inner ring and configured to open and close said aperture.

2. The lens barrel according to claim 1, wherein said outer ring is linearly guidable in the common optical axis  
20 direction relative to said guide barrel via a linear guide key and a linear guide groove provided on one and the other of said outer ring and said guide barrel, respectively.

3. The lens barrel according to claim 1, wherein said cam ring comprises a thick-wall cylinder portion and a

circumferential groove provided in front of said thick-wall cylinder portion; and

wherein said outer ring includes projections formed at a rear end portion of said outer ring to be engaged in said circumferential groove to be rotatable about the common optical axis along said circumferential groove, whereby said cam ring is movable in the common optical axis direction together with said outer ring.

4. The lens barrel according to claim 1, wherein said cam ring comprises at least one first cam groove and at least one second cam groove formed on inner and outer surfaces of said cam ring, respectively, said lens barrel further comprising:

a first cam mechanism for moving said movable lens frame to a position forward from said cam ring in the common optical axis direction by said rotation of said cam ring in accordance with a profile of said first cam groove; and

a second cam mechanism for moving said inner ring in the common optical axis direction by rotation of said cam ring in accordance with a profile of said second cam groove.

5. The lens barrel according to claim 4, wherein said profile of said first cam groove and said profile of said second cam groove are formed so as to move said movable lens frame and said inner ring while maintaining a substantially constant distance therebetween in the common optical axis direction.

6. The lens barrel according to claim 4, wherein said lens barrier mechanism comprises:

a pair of barrier blades driven to open and close said aperture; and

5 a drive ring driven to rotate about the common optical axis to drive said pair of barrier blades to open and close said aperture, said drive ring having at least one engaging surface;

wherein said cam ring includes at least one rotation transfer face formed at a front end of said cam ring to extend  
10 generally parallel to the common optical axis, said rotation transfer face coming into contact with corresponding said engaging surface of said drive ring to rotate said drive ring; and

wherein a portion of at least one of said first cam groove  
15 and said second cam groove extends in front of a rearward edge of said rotation transfer face in the common optical axis direction.

7. The lens barrel according to claim 6, wherein said drive ring comprises at least one recess, said engaging surface  
20 of said drive ring being formed as one surface of said recess.

8. The lens barrel according to claim 6, wherein said cam ring comprises at least one recess formed at said front end of said cam ring at portions other than portions of said cam ring on which said first cam groove and said second cam groove

are formed, said rotation transfer face of said cam ring constituting one surface of said recess.

9. The lens barrel according to claim 6, wherein said inner ring and said outer ring are movable between respective accommodation positions and respective advanced positions in front of said respective accommodation positions;

wherein said inner ring includes an opening which corresponds with said rotation transfer face of the cam ring; and

10 wherein said rotation transfer face of said cam ring extends through said inner ring via said opening of said inner ring to come in contact with corresponding said engaging surface of said drive ring when said inner ring and said outer ring are positioned in said respective accommodation positions.

15 10. The lens barrel according to claim 1, wherein said lens barrel comprises a zoom lens barrel.

11. The lens barrel according to claim 3, wherein said thick-wall cylinder portion is formed at a rear end of said cam ring, said circumferential groove being formed on an outer peripheral surface of said cam ring immediately in front of said thick-wall cylinder portion, and said projections extending radially inwards to be engaged in said circumferential groove.

12. The lens barrel according to claim 4, wherein said second cam mechanism moves said inner ring forward in the common

optical axis direction relative to said cam ring via said rotation of said cam ring in accordance with said profile of said second cam groove.

13. The lens barrel according to claim 6, wherein said  
5 recess is formed on an outer peripheral surface of said drive ring.

14. The lens barrel according to claim 1, wherein:

said guide barrel does not move in the common optical axis direction; and

10 said outer ring is linearly guidable in the common optical axis direction by said guide barrel toward an object side and an image side.